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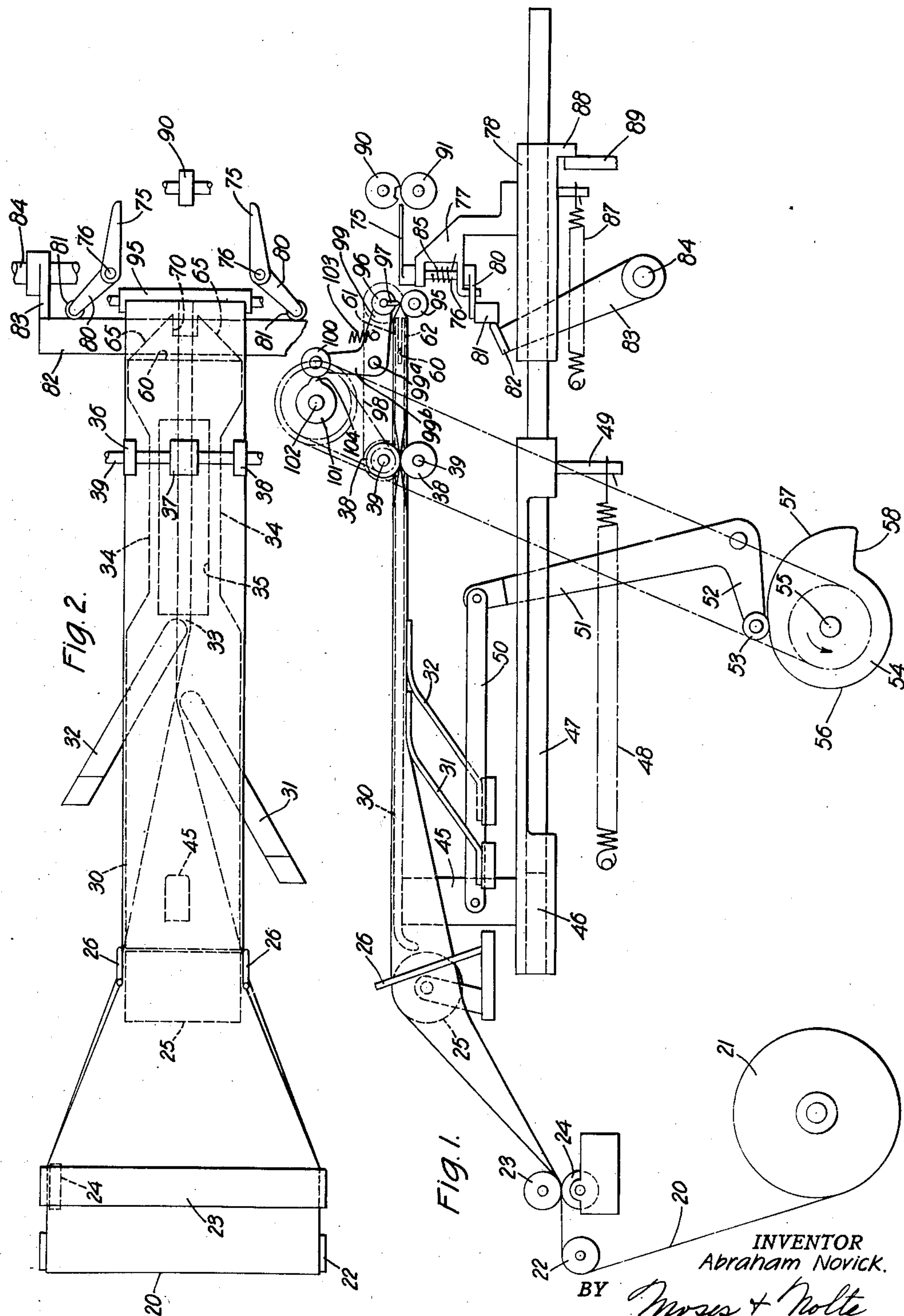
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2,125,306

MANUFACTURE OF SATCHEL BOTTOM BAGS

Original Filed May 5, 1933

3 Sheets-Sheet 1



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Fig. 10.

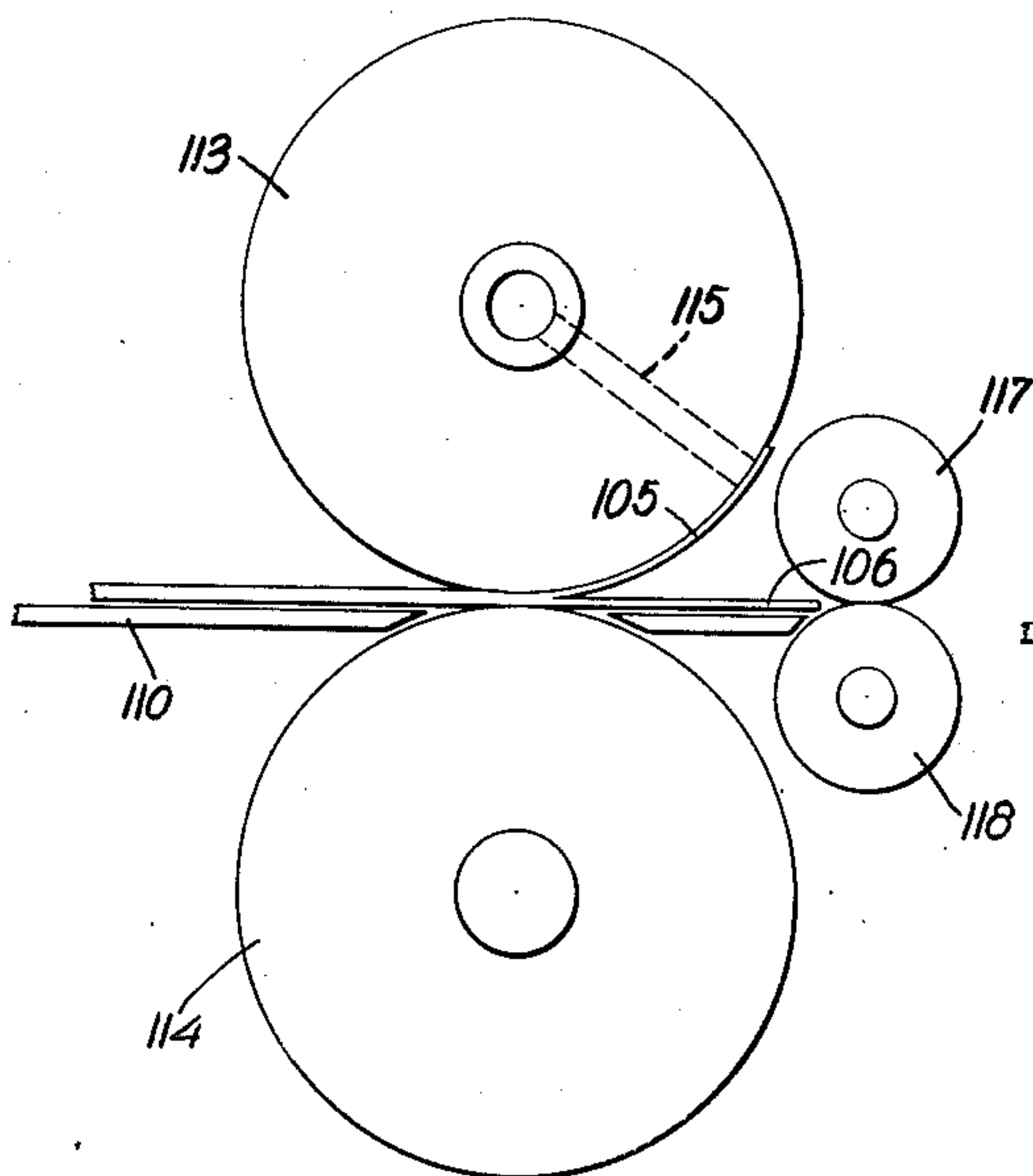


Fig. 11.

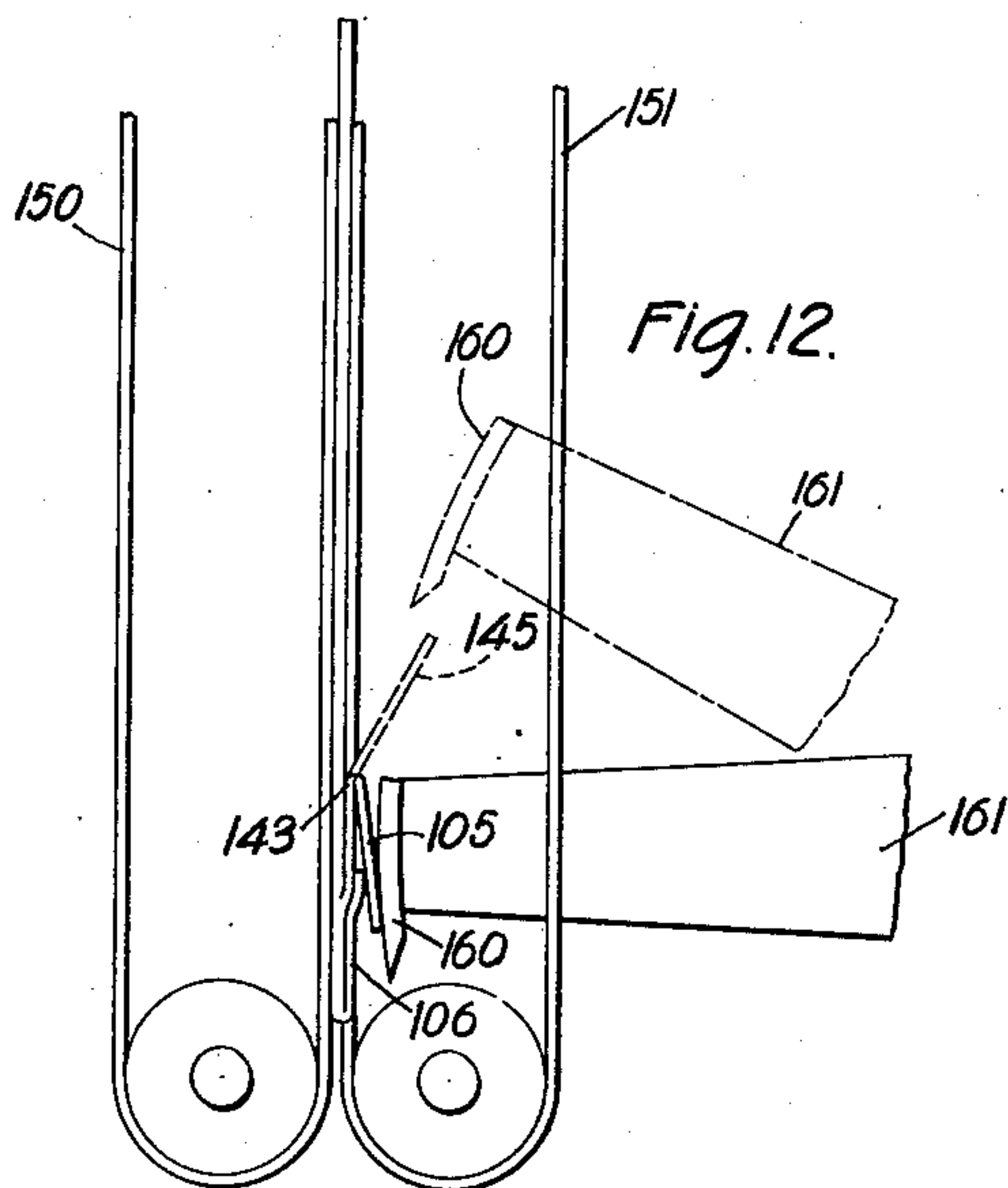
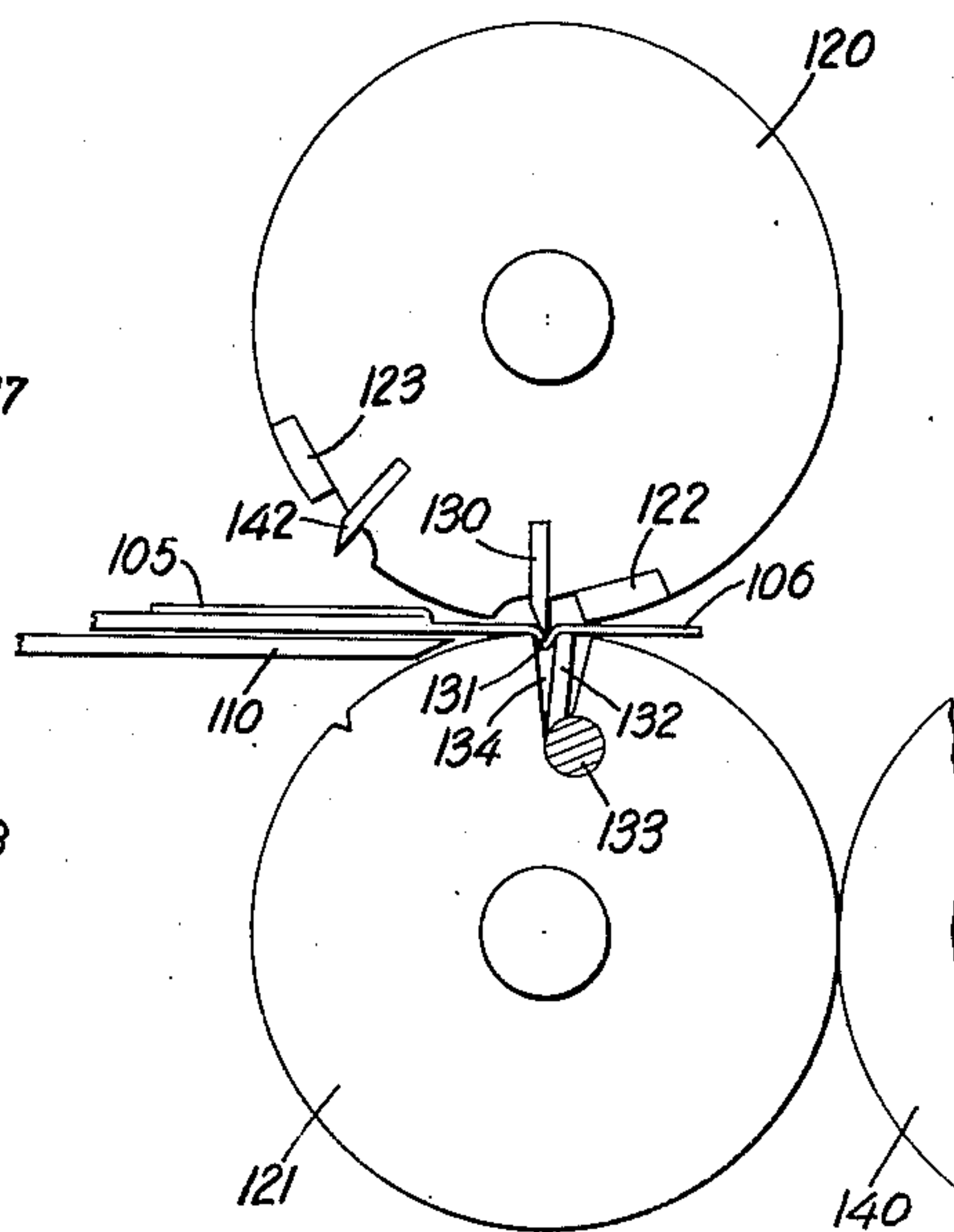
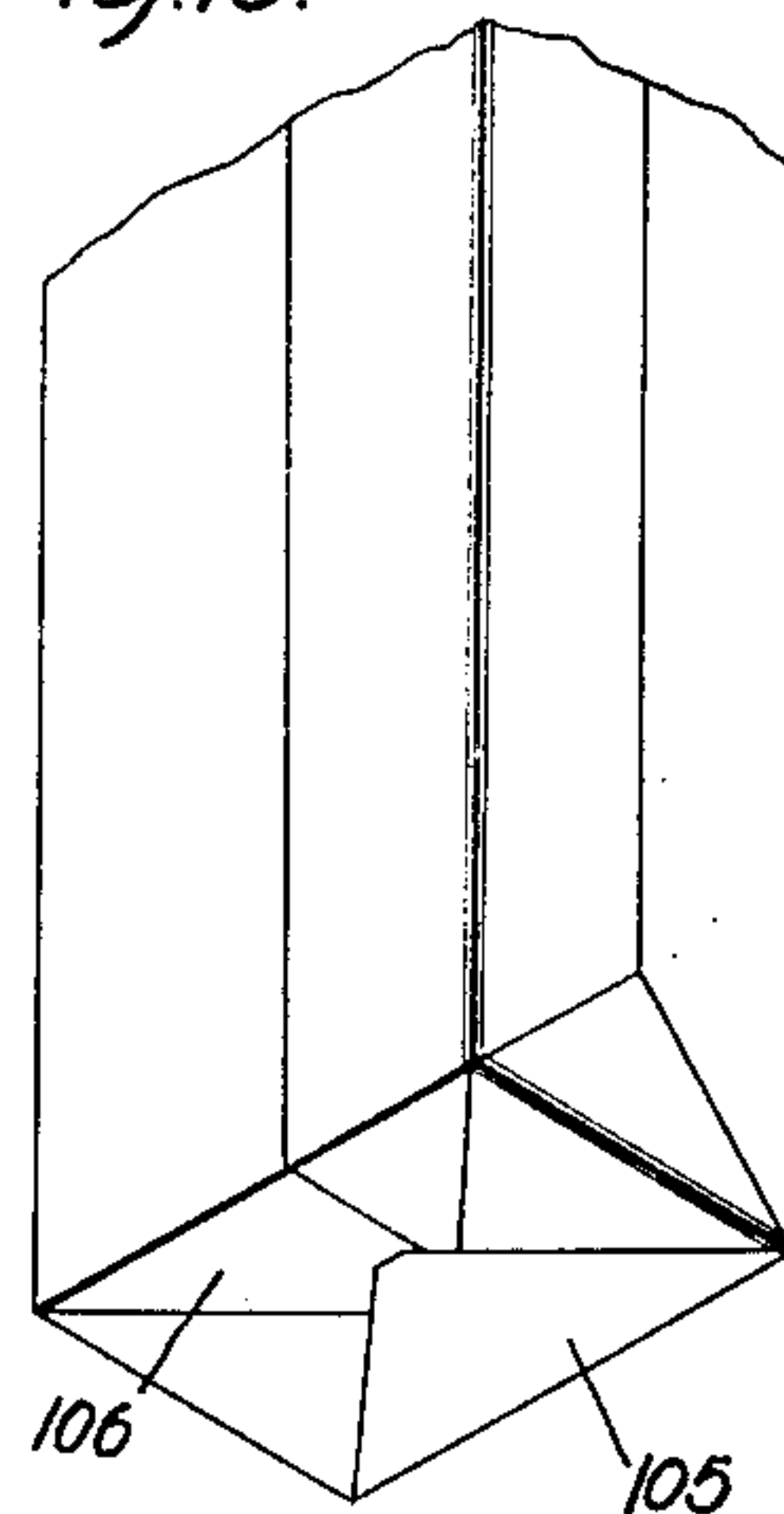


Fig. 13.



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MANUFACTURE OF SACHEL BOTTOM BAGS

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9 Claims. (Cl. 93—35)

This invention relates to the manufacture of satchel bottom bags and the like. It comprises an improved method manufacturing or folding such bags and also an improved apparatus especially adapted for the practicing of such method. The present invention is particularly designed for the manufacture of bags out of materials, the folding of which is difficult to control, such, for instance, as Cellophane, although it may be used in making bags out of paper of any kind. In the folding of the triangular indentations or creases which are folded in from the sides of the tubular web as the first stage in the folding of the satchel bottoms of bags, a difficulty is experienced in securing a proper fold where materials such as Cellophane are utilized and the ordinary paper bag making machines do not satisfactorily handle such material. It is a primary object of the present invention to provide an improved method and means of making these folds. Briefly this is accomplished by folding the primary folds between spaced plates which hold the upper and lower walls of the tube in position while the triangular portions are being folded in and positively assure the making of all folds or creases in their proper locations.

Other objects and advantages of the invention will appear in the course of the following detailed description showing one preferred manner of practicing the present invention.

The invention will best be understood by reference to the accompanying drawings which illustrate diagrammatically one preferred apparatus by which the invention may be practiced. It will be understood, however, that changes may be made in such apparatus and that the method of the present invention may be carried out by different means. In the drawings,

Figure 1 is a diagrammatic side elevation showing the first section of the machine;

Figure 2 is a diagrammatic plan view of the parts shown in Figure 1, the cut-off mechanism and associated parts being omitted;

Figure 3 is a diagrammatic side elevation of the second section of the machine;

Figure 4 is a plan view of a partially completed bag showing the same after the triangular corners have been turned in. This is the condition of the bag when it leaves the former plate;

Figure 5 is a view similar to Figure 4 showing the upper bottom flap folded back and gum applied to the flaps;

Figure 6 is an end view of the belt conveying mechanism shown in Figure 3, the bag being illustrated in a position about to enter between

the belts and a part of a second bag being shown near the bottom of the belts;

Figure 7 is a diagrammatic plan view showing a part of the former and showing the tucker blades in the position of having tucked the triangular corners between the former plates;

Figure 8 is a vertical section along line 8—8 of Figure 7, on an enlarged scale;

Figure 9 is a diagrammatic side elevation showing the front part of the former with the bag tube thereon, the front of the partially formed bag being engaged by the feed rolls and the cutter roll being shown raised away from the bag tube and former, the dotted circle showing the position of the cutter roll when moved to cutting position;

Figure 10 is a diagrammatic view in side elevation showing a bag passing between the rolls which separate the flaps of the bottom;

Figure 11 is a similar view showing a bag passing between the gumming and scoring or creasing rolls;

Figure 12 is a diagrammatic view in side elevation showing the outer bottom flap being bent into position by the flap folding blade; and

Figure 13 is a perspective view of the completed and opened bag.

Referring to the drawings in detail, particularly to Figures 1 and 2, the web 20 of Cellophane or other material is fed from a roll 21 over a roller 22 and between a pair of rollers 23 and 24, the latter of which applies gum along one edge of the web. The web then passes over a narrower roller 25 and is bent down across each end of such roller by guide bars 26. The web then passes over a wide plate or former 30 under which the side portions of the web are brought together and lapped by the folding arms or guides 31 and 32. The edges of the web are lapped over as indicated at 33 in Figure 2 and as one of the margins is gummed an overlapped seam is formed and the web becomes a flattened tube with the seam on the bottom. The former is provided with side cut-outs indicated in dotted lines at 34 in Figures 2 and 5 and with a central cut-out also indicated by dotted lines. Opposed sets of three rolls each, 36, 37, and 38, each set of rolls being mounted on a single shaft 39, operate on the tube where it passes these cut-outs. These rolls operate to feed the tube and the rolls 36 and 38 also crease the edges of the latter while the rolls 37 operate to iron the overlapped seam.

The former 30 is mounted to reciprocate longitudinally. For this purpose it is supported on a standard 45 which is carried on a carriage 46

mounted to reciprocate on a track 47. The carriage 46 is normally held in its retracted position (left hand position as shown in Figure 1) by a tension spring 48 which engages a pin 49 on the carriage. At proper intervals the carriage and former are moved towards the right by means of a link 50 which is attached to the standard 45 at one end and at its other end to the longer arm 51 of a bell-crank lever, the shorter arm 52 of which carries a roller 53 which is contacted by a cam 54 mounted on a shaft 55. The cam has a dwell 56 which permits the former to stay in its rearward position during the greater part of the rotation of the cam. At proper intervals, however, the inclined surface 57 of the cam will engage the roller and force the carriage and former towards the right until the drop 58 on the cam is reached whereupon the former will be immediately retracted into its left hand position by the action of the spring 48, the former travelling at the same speed as that of the web 20. At its forward end the former is provided with a transverse horizontal slot or cut-out 60 which divides the forward end of the former into upper and lower former plates 61 and 62 (see Figure 8). The edges of these former plates are cut off at angles of approximately 45° so as to form guide surfaces 65 over which the corners of the bag tube are folded when such corners are tucked in as will be described. The middle parts of the ends of the former plates are cut out as indicated at 70 so as to permit the gripping rollers to be described to grip the projecting end of the bag tube. It will be understood that the web having been formed into a tube about the former is continually fed forward by the rolls 36, 37, and 38 and at a proper point in the cycle the former itself is fed forward by the cam. While the former is in an advanced or advancing position the triangular corners at the front end of the flattened bag tube are folded or tucked in, such folded-in corners being indicated by dotted lines 72 in Figure 4. In the construction shown, this folding or tucking in is accomplished by means of a pair of tucker blades 75 which are mounted on vertical shafts 76 which are journaled in brackets 77 mounted on a carriage 78 adapted to reciprocate on track 47. Mounted on the lower ends of shafts 76 are arms 80 carrying rollers 81 which are adapted to be engaged by a cross bar 82 carried on the ends of arms 83 mounted on an actuated shaft 84. Upon the oscillation of the shaft 84 it will be seen that the cross bar 82 will engage the rollers 81 and cause the arms 80 to rotate the shafts 76, thereby swinging the tucker blades 75 from the position shown in Figure 2 into the position shown in Figure 7. This will tuck in the corners of the bag tube between the former plates 61 and 62 as clearly shown in Figure 8. Springs 85 are mounted on the shafts 76 to return the tucker blades to the positions shown in Figure 2. The carriage 78 is normally held in retracted position by coiled spring 87 in which position the rearward movement of the carriage is stopped by a lug 88 on the carriage which comes up against a fixed stop 89. The carriage 78 is given a limited movement to the right at the proper point in the cycle by the engagement therewith of the front end of the carriage 46 when the latter is moved to its extreme right hand position by the bell-crank lever and cam described. Mounted centrally of the line of travel of the bag tube and slightly in advance of the tucker blade 75 are a pair of feed rolls 90 and 91 which run at the

same surface speed as that of the feed rollers 36, 37 and 38. The rollers 90 and 91 grip the forward tip of the bag blank after the corners have been tucked in and advance the bag blank after it has been cut off by the cut-off means to be described.

The cut-off means comprise a roller 95 mounted below the plane of travel of the tube and a roller 96 above the plane of travel of the tube, the roller 96 carrying a cut-off blade 97. The roller 96 is driven by a chain 98 and is journaled in a pair of arms 99. The arms 99 are secured to a rock-shaft 99a and one of them has an upward extension 99b which carries a roller 100 to be engaged by a cam 101 mounted on a shaft 102. The arms 99 are normally held in position to raise the roller 96 away from the roller 95 by means of coiled springs 103, such raised position of the cutter roller being shown in full lines in Figure 9. The cam 101 has a tooth 104, which at a proper point in the cycle engages the roller 100 to rock the shaft 99a to thus swing the arms 99 so as to force the cutting roller into down position where it will cut off a bag when the cutter blade comes opposite to the roller 95. The object of raising the roller 96 above the roller 95 is to permit the front end of the former 30 and the bag tube thereon to be advanced beyond the cutter at the time when the tucker blades 75 are folding in the corners of the tube. After the end of the bag tube has been advanced until it is engaged by the feed rolls 90 and 91, the former is retracted as described. When the proper length of the bag tube has been fed the cutter roll is thrown down and the cutter acts to cut off the bag at the proper length.

To recapitulate briefly the operations thus far described, it will be seen that the web of Cellophane or the like is drawn from the roll 21, gummed at one edge and then folded into a flat tube around the former with the lapped seam underneath. This tube is fed forward with the former towards the tucker blades. During this forward feeding the cutter roll is raised out of the way. As the front end of the former is advanced with the tube thereover the tucker blades 75 come into action and fold the corners of the tube into the recesses between the upper and lower former plate portions 61 and 62, the proper formation of these folds being insured because the corners of the tube are firmly folded about the spaced former plate portions by the tucker blades which pass between such portions. After these folds are made the tucker blades are retracted and the continued advance of the former with the bag tube thereon carries the tip of the bag tube into engagement with the rolls 90 and 91 which feed the tube along. During the last part of the advance of the former, or in other words as soon as the tucker blades reach the bottom of the slot 60, the former carriage 46 engages the carriage 78 and pushes it ahead of it for a short distance. The former is now retracted, the carriage 78 is moved back to its normal position under the influence of spring 87 and the cut-off roll is moved down and at the proper instant cuts off the partially formed bag from the tube. The partially formed bag is then fed by the rolls 90 and 91 into the second part of the machine which will now be described.

Referring to Figures 3 and 4 it will be seen that the bag now comprises a cut-off section of the bag tube having the corners folded in as shown in Figure 4, thereby providing at the front end of the bag a pair of pointed flaps 105 and

106 (see Figure 8). This blank is advanced by the rollers 90 and 91 along a table 110 until it is gripped by the ironing rolls 111 and 112. From these ironing rolls it passes between a second pair of ironing rolls 113 and 114, the roll 113 being provided with one or more suction ports 115 of well known construction. As the bag blank passes between these rolls the suction is turned on to the port 115 and draws the upper flap 105 into close contact with the surface of the roll 113 as shown in Figure 10. As the overlapping seam of the tubular blank is at the bottom adjacent to the roll 114 the flap 105 is a seamless flap and therefore may be drawn up by the suction without danger of opening the seam as would be the case if the seam in the blank were adjacent to the roll containing the suction port. The lower flap 106 remains straight and passes between and is gripped by feed rolls 117 and 118. As the bag blank continues its travel the suction will be turned off on the port 115, thereby releasing the flap 105 which, however, is now in such a position that as the bag blank passes between rollers 117 and 118 the flap 105 will be bent back by engagement with the roller 117 and pressed down on top of the bag blank as shown in Figure 11. The bag blank now passes between a pair of rolls 120 and 121. The roll 120 is provided with gummer pads 122 and 123 of well known construction and which may be gummed in any usual manner (not shown). The pad 122 applies a patch of gum 124 (Figure 5) to the upper face of the lower flap 106 while as the rotation of the rolls continues the gummer 123 will apply a patch of gum 125 to the flap 105. The roll 120 is also provided with a tucker blade 130 which makes a crease 131 in the flap 106 and tucks it into position to be engaged by a spring pressed gripper bar 132 mounted on a rotatable base 133 in a groove 134 in the roll 121. The gripper bar 132 is of well known construction and is arranged to be moved by known mechanism (not illustrated) so as to pinch the crease 131 between the edge of the bar and the wall of the groove 134, thereby gripping the crease and temporarily attaching the flap 106 to the roll 121. The continued rotation of the roll 121 will now draw the bag blank forward and carry the flap 106 around the roll. Owing to the crease 131 the tip of the flap 106 beyond the crease will tend to stand away from the surface of the roll 121 while the crease itself is still held by the gripper bar and carried around by the rotating roll. A roll 140 is provided which is mounted to rotate on an axis at the same level as the axis of the roll 121 and eventually the upstanding tip of the flap 106 will come into contact with the surface of the roll 140 and will be bent back upon the rest of the flap 106 as shown in the upper part of Figure 6. The bottom of the bag will pass between the rolls 121 and 140 in this condition and the flap 106 will be ironed into the folded shape shown by these rolls, the bent over part of the flap adhering to the body of the flap because of the gum applied thereto. The roll 140 is provided with a cutout 141 to clear the gummed portion 125 on the flap 105. The roll 120 is also provided with a creaser blade 142 which engages the flap 105 as the latter passes under the roll 120 and makes a crease 143 in the flap 105 so that the tip of the flap will stand out slightly away from the plane of the bag blank as shown by the dotted lines 145 in Figure 12.

Referring now to the mechanism shown in Figures 3, 6 and 12, which takes the bag blank

after it passes between the rolls 121 and 140, this mechanism comprises two spaced pairs of belts, each comprising a belt 150 and a belt 151. These pairs of belts are spaced far enough apart so that the respective pairs will grip the edges of the bag blank at points beyond the corners 152 and 153 where the creases are made in the flaps 106 and 105. By reason of this arrangement it will be seen that the gummed tip portion of the flap 105 beyond the crease 143 is free while the bag blank is being passed along between the belts. As the blank passes down between the belts means are provided for turning the tip of this flap over so that it will overlie the tip of the flap 106 and thereby seal the bottom of the bag. I have illustrated for the purpose of turning over this flap, a flap folding blade 160 which is mounted on an arm 161, suitable means, not shown, being employed for moving this arm up and down in properly timed relationship with the passage of the bag blank. As clearly shown in Figure 12, when this arm comes down it engages the tip of the flap which is standing out from the plane of the bag blank and bends it down over the tip of the flap 106. The bag is delivered from the machine with the bottom folded as shown in the lower bag in Figure 6, the plane of the bottom being parallel to the plane of the bag blank and the tips of both flaps being sealed down. When the bag is opened up for use it is of the general form shown in Figure 13.

While one particular form of apparatus is illustrated for carrying out my invention, it will be understood that variations in the apparatus may be made and that the method described may be carried out by other apparatus or partially by hand. For instance, the bag blank after being folded into the shape shown in Figure 4 by the use of former plates and tucker blades of any desired construction, need not be formed into the completed bag in the same machine as described, but the bag may be completed by hand or in a separate machine.

I claim:

1. In a method of manufacturing satchel bottom bags, the step which consists in holding a bag tube flat and fully distended with its opposite faces flat and in spaced, parallel relation, and simultaneously folding in the corners of the bag tube between said faces.

2. In a method of forming satchel bottom bags, the steps which consist in folding a web into tubular form, holding opposite faces of the formed tube flat and in spaced parallel relation, tucking the corners of the forward end of the bag tube into the space between said faces while maintaining the tube flat and fully distended, advancing the bag tube, and cutting off a blank length from the forward part of the bag tube having the tucked-in corners.

3. A method of forming satchel bottom bags, which consists in forming a web into a flattened tube, tucking in the corners of the forward end of the tube and cutting off the forward portion of the tube so as to form a bag blank having the corners tucked in, thereby providing the blank with parallel triangular end flaps, folding one of said flaps back upon the body of the blank, gumming the inside surfaces of the tip portions of said flaps, bending the tip portion of the other forwardly projecting flap back upon itself, creasing the flap which has been bent back upon the body of the bag transversely so as to cause the tip portion of said flap to spring away

from contact with the body of the bag blank and bending said tip portion over into engagement with the tip portion of the other flap so as to complete the bottom of the bag.

5 4. In a method of forming satchel bottom bags, the step which consists in positively holding the bottom flaps to shape while the forward corners of the tubular bag blank are simultaneously bent in as far as possible to form such
10 flaps.

5. The method as claimed in claim 1, in which the folding in of the corners is effected in such a manner as to operate upon initially free substantially triangular areas at the forward end
15 of the tube and results in bending such triangular areas into the form of parallel pointed flaps at said forward end.

6. The method as claimed in claim 1, in which the bag blank web is gripped and advanced during the step by which the corners are simultaneously folded in to form the bottom flaps, the tip
20 of each such flap being free from engagement while the bag blank is gripped and advanced.

7. The method of making bags which comprises forming a succession of individual tubular blanks each with the corners at the forward end of the blank, folded in to provide opposed upper and lower, substantially triangular end
25 tabs, advancing each individual blank uninterruptedly along a definite path with the tabs leading, yieldingly drawing one of the tabs forward out of said path to deflect it while posi-

tively continuing the advance of the other tab and the blank body, and then advancing the deflected tab after the undeflected tab while pressing the deflected tab down flat against the blank body.

8. The method of making bags which comprises advancing a web of bag material, forming the leading end of the web into a flat tube, folding in the edges of the tube at the forward corners of the tube simultaneously between the
10 faces of the tube, each through substantially a right angle, while maintaining the faces of the tube in spaced, substantially parallel relation, to form a pair of opposed substantially triangular
15 tabs on the forward end of the tube, and thereafter severing a bag length from the tube.

9. The method of making bags which comprises advancing a web of bag material, forming the leading end of the web into a flat tube, folding in the edges of the tube at the forward corners of the tube simultaneously between the faces
20 of the tube, each through substantially a right angle, while maintaining the faces of the tube in spaced, substantially parallel relation, to form a pair of opposed, substantially triangular tabs
25 on the forward end of the tube, severing a bag length from the tube, folding back one of the tabs onto the blank body, and thereafter folding the tab tips toward one another and uniting them in superposed relation.

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